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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

Honorable John Warner
United States Senate
Washington, D.C. 20510

Dear Senator Warner:

This is in reply to a conversation between Doron Fertig, of my staff and Richard Traylor, your intern, on January 26, 1993, regarding the Notice of Proposed Rule Making (Notice) in PR Docket No. 92-235, 57 FR 54034 (1992). This Notice proposes comprehensive changes to the Commission's Rules governing the private land mobile radio services operating in the frequency bands below 512 MHz.

Those rules have been in place for over 20 years. While they have been amended on numerous occasions since that time, they nonetheless embody regulatory concepts based on yesteryear's technology and, unless changed, will stifle the growth and development of private land mobile radio technology and services, which are used primarily by local governments, public safety entities, and businesses to enhance their productivity. The Commission issued the Notice, therefore, to solicit comment from all interested persons on a wide variety of proposals designed to increase channel capacity, to promote more efficient use of these channels, and to simplify the rules governing use of these channels.

The proposals in the Notice reflect to a large extent concepts and proposals submitted in the initial inquiry stages of this proceeding. None of the proposals set forth in the Notice, however, are engraved in stone. Indeed, the proposals represent our best judgment at this stage of the proceeding on steps that must be taken to improve the regulatory climate for users of the private land mobile radio spectrum below 512 MHz. To this end, some of the critical issues that must be resolved relate to channel spacing, the amount of time provided to users to convert to new technical standards, how the 300 to 500 percent increase in channel capacity should be licensed, how the rules should be written to provide users technical flexibility, and whether the current nineteen radio services should be consolidated and, if so, how. I have enclosed for your information a copy of that part of the Notice that describes the numerous proposals.

We are, of course, sensitive to the concerns of users of private land mobile radio spectrum and the impact that these proposals may have on their radio systems, including the costs of required modifications.

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Honorable John Warner

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As indicated in the Notice, however, we remain convinced that without significant regulatory change in radio operations in the bands below 512 MHz, the quality of communications in the private land mobile radio services will continue to deteriorate to the point of endangering public safety and the national economy.

Comments on the proposals set forth in the Notice are due February 26, 1993, and Reply Comments are due April 14, 1993. We expect final rules to be issued near the end of 1993. If you or your staff have any further questions, please contact me at (202) 632-7597, or Dr. Fertig at (202) 632-6497. Thank you for your interest in this proceeding.

Sincerely,

Richard J. Shiben
Chief, Land Mobile & Microwave
Division

Enclosure:
Notice

cc:
Chief, PRBureau
Chief, LM&M Divison
Deputy Chief, LM&M Division
Lou Sizemore, Room 857
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Licensing Div., PRB, c/o Room 5202
P&P Branch Files

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CONGRESS/warner

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Replacement of Part 90 by Part 88 to) PR Docket No. 92-235
Revise the Private Land Mobile Radio)
Services and Modify the Policies)
Governing Them)
)

NOTICE OF PROPOSED RULE MAKING

Adopted: October 8, 1992

Released: November 6, 1992

Comment Date: February 26, 1993

Reply Comment Date: April 14, 1993

By the Commission: Commissioner Barrett issuing a separate statement.

I. Introduction

1. On July 2, 1991, we released a Notice of Inquiry (Inquiry) to gather information on how to promote more efficient use of the frequency bands below 512 MHz allocated to the private land mobile radio (PLMR) services.¹ Based on the input received in response to our Inquiry, today we are adopting this Notice of Proposed Rule Making (Notice) that contains a comprehensive set of proposals designed to increase channel capacity in these bands, to promote more efficient use of these channels, and to simplify our policies governing the use of these bands by a wide variety of small and large businesses and public safety agencies throughout this nation.² The magnitude of these proposed policy changes makes this an ideal time to create Part 88, and thus correct many unrelated deficiencies that exist in our current rules governing the PLMR services. The proposed rules are in many ways radically different from our current rules. We have, however, attempted to develop a new set of rules that are flexible and simple with regard to the technical and operational characteristics of the private land mobile radio services as well as our mechanisms for licensing users in these services.

2. We are convinced that, without significant regulatory changes in the bands below 512 MHz, the quality of PLMR communications will likely deteriorate to the point of endangering public safety and the national economy. In this proceeding, therefore, our goal is to develop a regulatory scheme that increases channel capacity for PLMR users. We are also sensitive to the need for a reasonable transition period for users to convert their radio systems to newer, more spectrum efficient technologies. These proposals are complex and deserve the full time and attention of all interested parties. In sum, the Notice is a critical step in providing for the future communications needs of private land mobile radio users. We are, therefore, looking forward to their comments and any alternatives that they may have to the proposals we have developed for their consideration.

3. It may be helpful to outline how the proposals in this Notice are presented for consideration. The Notice itself merely presents our proposals in a broad and general form. Readers will find more detail regarding each of our proposals in Appendix A, which explains each major proposal. Readers should also carefully examine Appendix D, the proposed Part 88 that would replace Part 90. To assist in this detailed review, we have provided Appendix E, an index that cross-references proposed rules in Part 88 to current rules in Part 90.

II. Background

4. In the past seven decades, PLMR has become one of the largest, most important areas regulated by the Commission. When making new PLMR spectrum allocations, we have generally been innovative and required or induced industry to be innovative. The rules for the bands in use longest have often been amended, yet remain based on much earlier technologies and regulatory concepts. Many PLMR channels are now unacceptably crowded and our rules for certain bands are unacceptably archaic and convoluted. The Inquiry solicited comments on a wide range of technical and policy issues related to the use of the PLMR bands below 512 MHz, with the overall goal of developing modern rules to support future technologies.

5. We received over 120 comments and reply comments. The Private Radio Bureau, in cooperation with the Annenberg Washington Program, Communications Policy Studies, of Northwestern University, also sponsored a conference on this topic on November 14, 1991. Nearly all the commenters appreciated that the Inquiry was a necessary step for insuring that the long term communications needs of the PLMR community are met. Many comments highlighted the invaluable and irreplaceable need for radio spectrum for one and two-way mobile communications. Most commenters suggested that we proceed immediately to increase spectrum efficiency through technical changes as well as various policy changes. In preparing this Notice, we again carefully reviewed the existing environment, with the goal of determining the best possible regulatory framework.

III. Discussion

6. We propose below a series of major changes in the way we regulate the PLMR services below 512 MHz. There are four major proposals. First, we propose spectrum efficiency standards that should increase the capacity, in terms of number of available channels, of several bands by 300 to 500 percent. These standards would generally reduce channel spacing to 6.25 kHz or less, while at the same time providing technical flexibility. Second, we propose a channel exclusivity option in the bands above 150 MHz. This would be accomplished using a market-based approach called "exclusive use overlay," which involves achieving exclusivity through concurrence of existing users. We would, in addition, leave a significant number of channels available for licensing on the traditional shared use basis. Third, we propose to consolidate the current 19 radio services. Fourth, we propose new technical and operational standards. For example, we propose significantly reducing permissible transmitting power levels. This would permit efficient geographic co-channel reuse. In addition, we propose to permit centralized trunking, set aside channels for specific operational characteristics, designate channels for new high-technology type of operation, and generally simplify our rules. These changes would greatly expand capacity and improve quality

of service, without imposing unreasonable burdens on present or future licensees.

A. Spectrum Efficiency Standards.

7. Creation of narrowband channels and adoption of spectrum efficiency standards. A great deal of the Inquiry focused on specific technologies and technical regulation. We asked about a variety of technologies, including trunking, packet radio, spread spectrum, and narrowband.³ We also discussed the concept of a spectrum efficiency standard, which would require that systems be at least as efficient as some benchmark technology,⁴ as a method of providing technical flexibility while at the same time prohibiting spectrum inefficient technologies. Commenters emphasize that our proposals must provide technical flexibility⁵ and encourage use of new technologies in the existing bands, particularly in urban markets. The comments clearly indicate that the benchmark technology should be narrowband.⁶

8. Thus, we are proposing a set of spectrum efficiency standards based on narrowband technology. The standards would provide for greater efficiencies over time, moving from the current 25 kHz channel spacing eventually to 6.25 kHz in the 421-430, 450-470 and 470-512 MHz bands and to 5 kHz channel spacing in the 72-76 (for low power mobile operations) and 150-174 MHz bands. The process would occur in two stages, with the first stage requiring existing users to reduce their occupied bandwidth.⁷ These proposed standards are designed to promote technical flexibility, allowing the economic and public safety considerations to determine the best technology for each application, while at the same time requiring that PLMR allocations be used efficiently.

9. This proposal is consistent with comments of most frequency coordinators, the Land Mobile Communications Council (LMCC), Motorola, Inc., American Telephone & Telegraph Company (AT&T), and the Telecommunications Industry Association (TIA).⁸ In addition, several parties favor spectrum efficiency standards, but not necessarily a channel split.⁹ Commenters also indicate they want the option to use 25 kHz Time Division Multiple Access (TDMA) technology.¹⁰ This proposed plan would permit this option.

10. We also propose loading standards that provide existing licensees an opportunity to take advantage of the newly created narrowband channels. Even if they lack the per-channel loading standard, existing licensees could still retain two narrowband channels for every existing channel by implementing this technology at least two years sooner than required. Together with exclusivity, this would provide licensees with an incentive to use narrowband channels as soon as economic and public safety conditions indicate. Thus, additional capacity would become available at a quick and smooth pace. Licensees could fund conversion to narrowband by reassigning part of an existing wideband channel to a party willing to reimburse them.

B. Exclusivity.

11. Creation of a channel exclusivity option. Currently our rules governing the bands below 470 MHz do not provide for channel exclusivity.¹¹ The Inquiry focused a great deal on the concept of exclusivity, combined with flexible technical standards, as an incentive to promote spectrum efficiency.¹² Most commenters favor some sort of channel exclusivity. The Joint

Commenters, for example, state that they "agree wholeheartly ... that exclusive channel assignments provide a strong stimulus for licensees to employ efficient modes of operation."¹³ Exclusivity makes technical flexibility more viable. For example, centralized trunking is currently based on exclusivity. Thus we propose permitting exclusive channel assignments in most of the 150-174 MHz, 421-430 MHz, and 450-470 MHz bands.

12. The Inquiry discussed three methods of converting the bands below 470 MHz to exclusive assignments: stopping new licensing, emptying a band, and exclusive use overlay.¹⁴ Of these three methods of achieving exclusivity, commenters generally opposed the first two plans. Several commenters, however, specifically favor the exclusive use overlay plan.¹⁵ Thus we propose that exclusivity would be achieved through an exclusive use overlay (EUO) plan similar to that discussed in the Inquiry.¹⁶ Our proposal would permit a temporary freeze of licensing on specific channels at specific locations if applicants obtain sufficient concurrence from existing large (as defined by loading criteria) licensees. If concurrence of all large licensees is achieved, then we would permanently freeze licensing, i.e., no additional use of that channel within 50 miles would be permitted without concurrence of the EUO licensees.¹⁷ Thus, the EUO option is an opportunity to obtain exclusivity. Several other commenters favor converting de facto exclusive licenses to actual exclusive licenses.¹⁸ Our proposal, including its preferences to existing licensees, achieves that goal.¹⁹ Other licensees favor use of loading standards, as at 800 MHz.²⁰ Our proposal applies loading criteria, but in a different manner.

13. Several frequency coordinators request that exclusivity be administered through them. AAR, for example, claims that exclusive assignments can better be achieved through coordination. These proposals would leave frequency coordinators with a major role in administering exclusivity. The standards for exclusivity, however, must be determined through the rule making process. If user groups have a need to be provided a greater degree of exclusivity for certain types of systems, then they should explicitly state what the standards and eligibility requirements for expanded protection should be.²¹

C. Radio Services.

14. Consolidation of the Private Land Mobile Radio Services. The Inquiry discussed the possibility of consolidating the present 19 PLMR services or increasing intercategory sharing.²² We pointed out that channel utilization is not consistent across the 19 user groups. A study of our licensing database in April, 1992, showed very wide variations in usage, often exceeding factors of ten for channels in the same frequency band designated for different radio services. We also noted that "the current allocation system ... inhibits spectrum efficiency by making certain spectrum efficient technologies more difficult to implement."²³

15. The Inquiry also discussed the merits of private carriers. We noted that the "private carrier option may be a practical method of making spectrum efficient communications services available to small licensees"²⁴ and that "[p]rivate carriers have more incentive to enhance spectrum efficiency...."²⁵

16. Consolidation of service pools generated the widest range of comments to the Inquiry.²⁶ Several frequency coordinators oppose a proposal to consolidate the current radio

services²⁷ on the grounds that current interservice sharing rules²⁸ work. They are supported in their views by licensees within these service categories. On the other hand, the Joint Commenters, Associated Public-Safety Communications Officers, Inc. (APCO) and Utilities Telecommunications Council (UTC) all generally favor consolidation.²⁹ Together, these three sets of comments represent over 75 percent of the licensed transmitters in the affected bands, plus all the licensed PLMR activity above 800 MHz. The Joint Commenters note that, "[w]ithout such a consolidation, the industry may find it cumbersome to implement spectrum efficient technologies ... in the bands below 470 MHz."³⁰ These commenters also maintain that the current interservice sharing rules do not provide adequate relief to an applicant to obtain channels allocated to other service pools because the system is expensive, time-consuming, and burdensome to the applicant, and typically does not provide the applicant the needed spectrum.³¹ Numerous other parties favor consolidating radio pools. The State of California states that the "current practice of allocating specific frequency bands to the unique divisions of public safety ... causes complications in areas where some bands are underutilized, while others are overcrowded."³²

17. Based on the comments, we believe that some consolidation of the current alignment of radio services may be necessary to realize the maximum benefits of the PLMR spectrum. We thus propose two specific alternatives in this proceeding, both of which are designed to protect all existing users, to assure a smooth transition that minimizes cost to users, and to promote flexibility. Specifically, we propose either to (1) consolidate the current radio services into three broad categories (Public Safety, Non-Commercial and Specialized Mobile Radio) plus a General Category Pool encompassing all three services, or (2) retain the current services and assign to those services their existing frequency assignments but assign all new frequencies to the proposed new broad categories and the General Category pool. The rules proposed in Appendix D present a model based on consolidating the existing services into the three broad service categories, which provides a picture of what a new Part 88 would look like under one set of assumptions. We want to emphasize, however, that we do not have a preference for either of the alternatives set forth herein. Rather, we invite comment on both proposals as well as any other alternative that will fulfill the goals and objectives of this proceeding. Commenters offering alternatives should provide, to the maximum extent possible, the text of specific rules to implement their proposal.

18. **Frequency coordination.** We propose that frequency coordinators continue to play a major role in managing the PLMR spectrum. We propose that if we adopt option 1 from paragraph 17 above, Public Safety Radio Service applicants would be permitted to use any of the current public safety frequency coordinators. Non-Commercial and General category applicants could use any recognized frequency coordinator.³³ We propose that if we adopt option 2, channels designated for the current 19 narrow radio services would continue to be coordinated only by their current coordinator. Channels designated for the Public Safety Radio Service could be coordinated by any of the existing coordinators for the public safety radio services, and channels designated for the Non-Commercial Radio Service and General Category Pool could be coordinated by any recognized frequency coordinator. Finally, above 800 MHz APCO, NABER and SIRSA would coordinate the same channels they currently coordinate.

19. Currently, frequency coordination is a process in which each applicant was given the best assignment possible. In the future, frequency coordinators should strive to retain as large a spectrum reserve as possible. For example, frequency recommendations should place systems as close geographically as possible without causing interference. Small systems not qualifying for an EUO preference should be stacked on the same channel (vertical loading), rather than be assigned separate channels (horizontal loading).

D. Technical and Operational Rule Changes.

20. **Adopt reduced ERP and HAAT Limits.** The Inquiry requested comments on reducing the maximum permitted transmitter power levels.³⁴ We noted the advantages of greater reuse of spectrum over geographic space. Many commenters favor some method of limiting emissions, recognizing that many current licensees use far more power than necessary. The State of California cites "a small town of three square miles operat[ing] 250 watt base stations."³⁵ Public safety entities tended to favor service area contours rather than simple power limits.³⁶ A 75 watt power limit was recommended by various Land Transportation frequency coordinators.³⁷ As they point out, the railroad, taxi, and trucking industries all have needs as complicated and critical as most users. Users in these services have all found 75 watts to be an acceptable power limit.³⁸ Use of high gain antenna systems can, however, result in overly powerful systems. Thus, we propose for the 150-174 and 450-470 MHz bands reducing the standard limits on effective radiated power (ERP) to 300 watts, with lower ERP limits for systems with antenna heights above average terrain greater than 60 meters.³⁹ This proposal is closely tied to our exclusive use overlay proposal because it would enable us to propose co-channel separations of 50 miles, rather than the 70 mile separation used in the bands above 800 MHz.⁴⁰

21. **Providing for alternative operations.** Although a main focus of this Notice is the creation of a large number of exclusive use channels, we also propose that applicants be offered a full array of options. For example, the entire 25-50 MHz band and a number of channels in the 150-174 MHz and 450-470 MHz bands will not include a channel exclusivity option. Furthermore, our proposed rules would provide for alternative types of systems, such as low power, itinerant wide-area, and mutual aid operations. Finally, we propose a set of channels in the 150-162 MHz band be set aside for large innovative operations.

22. **Promotion of interoperability.** Interoperability is a key concern of public safety entities. The work of APCO-25 is discussed by several commenters.⁴¹ The initial output of this committee will be digital standards using 12.5 kHz channels. Agencies in various jurisdictions must be able to communicate with each other. Although we are not proposing to mandate such standards, we might eventually propose standards on mutual aid channels. This would provide an impetus for de facto standardization, yet still permit competing technologies.

23. **Designation of Channels for Innovative Shared Use.** We propose designating 258 channel pairs in the 150-162 MHz band for innovative, highly spectrum efficient radio systems. Although we request a full range of comments concerning use of these channels, we propose that most of these channels be designated as shared use voice/data channels, with a very limited number of channels assigned on an exclusive basis for control purposes.⁴²

Licenses would be made available in seven regions using lotteries. Licensees would be required to update the technology used in their systems periodically to increase its spectrum efficiency. Thus, this proposed operation would serve as a base for technical innovation that could be used by other PLMR licensees. As an alternative, we propose issuing five 50 channel exclusive use licenses per region.

24. **Permitting trunked operations.** A trunked system is a multi-channel system in which a user can transmit on any of the channels through specific base station facilities. The system automatically searches for and assigns a user an open channel assigned to that system. Trunked technology provides significantly more efficient use of the radio spectrum in terms of the number of users that can be supported.⁴³ Centralized trunking is not currently permitted in the bands below 800 MHz.⁴⁴ The vast majority of commenters favor permitting centralized trunking when a licensee has at least *de facto* exclusivity. Thus, we propose that centralized trunking immediately be explicitly permitted where exclusivity is recognized by the Commission or when all co-channel licensees within 50 miles concur.

E. Miscellaneous Proposals.

25. **Modification of Existing Systems.** A key concern to many commenters is that current licensees be given sufficient time to amortize the cost of existing equipment prior to the date that narrowband equipment is mandated.⁴⁵ Adjustments to existing systems would, however, accelerate implementation of narrowband and other spectrum efficient technologies. The Joint Commenters state that "it appears that the reduction in transmitter deviation can be accomplished without great expense through a combination of manual adjustment of existing equipment and software."⁴⁶ Thus, we propose requiring certain changes to existing systems. All existing systems between 150 and 512 MHz would be required to reduce their transmitter deviation to no more than 3 kHz and meet the new power limitations by January 1, 1996.

26. **Retaining offset channels in the 450-470 MHz band.** Between the primary channels in the 450-470 MHz band are channels offset by 12.5 kHz, generally available on a secondary basis for low power mobile operations.⁴⁷ These channels are heavily occupied and are considered essential by several commenters.⁴⁸ We propose that these channels remain licensed on a secondary basis. Their bandwidth would also be subject to the general spectrum efficiency requirements.⁴⁹ These channels would be available in the Public Safety Radio Service and the General Category Pool. In addition, we would permit, without a separate authorization, very low power (20 mW or less) telemetry operations on additional offset channels in the 450-470 MHz band. We believe these proposed changes, particularly taken in conjunction with the general proposed ERP limitation will, for example, help serve the significant spectrum needs for such low power operations.⁵⁰

27. **General simplification of Part 90.** Our proposed rules, renamed Part 88, are generally much simpler and clearer than current rules. Some of the proposed changes are a) eliminating the majority of footnotes to frequency tables, b) improving the glossary, c) adding an index, d) consolidation of many grandfathering provisions, e) radiolocation as an operation rather than a radio service, f) consolidating Subparts L, S, and T into the main sections of Part 88, and g) making a general editorial reorganization.

IV. Conclusion

Initial Regulatory Flexibility Analysis

28. An Initial Regulatory Flexibility Analysis is contained in Appendix B to this Notice of Proposed Rule Making. As required by Section 603 of the Regulatory Flexibility Act, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document. Written public comments are requested on the IRFA. These comments must be filed in accordance with the same filing deadlines as comments on the rest of the Notice, but they must have a separate and distinct heading designating them as responses to the Initial Regulatory Flexibility Analysis. The Secretary shall send a copy of this Notice of Proposed Rule Making, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with paragraph 603(a) of the Regulatory Flexibility Act. Pub. L. No. 96-354, 94 Stat. 1164, 5 U.S.C. § 601 *et seq.* (1981).

Paperwork Reduction Act Statement

29. The proposals contained in this Notice have been analyzed with respect to the Paperwork Reduction Act of 1980 and found to decrease the burden imposed on the public by eliminating the option for multiple licensing, and to impose an additional burden on licensees seeking to convert their frequencies from shared use to exclusive use by requiring a proposed form to be filed. Whether the proposal is viewed as a decrease, increase or modification of existing collection burdens, it is subject to approval by the Office of Management and Budget as prescribed by the Act.

Ex Parte Rules - Non-Restricted Proceeding

30. This is a non-restricted notice and comment rule making proceeding. Ex parte presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in Commission rules. See generally 47 C.F.R. §§ 1.1202, 1.1203, and 1.1206(a).

Comment Dates

31. Pursuant to applicable procedures set forth in Sections 1.415 and 1.419 of the Commission's Rules, 47 C.F.R. §§ 1.415 and 1.419, interested parties may file comments on or before February 26, 1993, and reply comments on or before April 14, 1993. To file formally in this proceeding, you must file an original and four copies of all comments, reply comments, and supporting comments. If you want each Commissioner to receive a personal copy of your comments, you must file an original plus nine copies. You should send comments and reply comments to Office of the Secretary, Federal Communications Commission, Washington, DC 20554. Comments and reply comments will be available for public inspection during regular business hours in the FCC Reference Center, Room 239, 1919 M Street, N.W., Washington, DC 20554.

Ordering Clause

32. Authority for issuance of this Notice of Proposed Rule Making is contained in Sections 4(l) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(l) and 303(r).

Contact Person

33. For further information about this Notice, contact Doron Fertig, Private Radio Bureau, (202) 632-6497 or for technical issues, Eugene Thomson, Private Radio Bureau, (202) 634-2443.

FEDERAL COMMUNICATIONS COMMISSION

Donna R. Searcy
Secretary

FOOTNOTES

1. Notice of Inquiry (Inquiry), PR Docket No. 91-170, 6 FCC Rod 4125 (1991).
2. Because we received the information we were seeking from the Inquiry, and the scope and focus of this Notice differs from the Inquiry, we have opened a new Docket and will close PR Docket No. 91-170.
3. See Inquiry, paragraphs 26-44.
4. See Inquiry, paragraphs 101-106.
5. LMCC urges us "not to mandate any one technology, transmission technique, or system design. Rather, the Commission should adopt rules and policies that would provide land mobile users with substantial latitude in choosing among available technologies and system designs." Comments of LMCC, 5.
6. See, for example, Comments of LMCC.
7. The proposed first stage would reduce channel deviation for existing systems, thus reducing noise caused by and to adjacent channel assignments, and facilitating the addition of new channel assignments as soon as possible, without requiring actual replacement of equipment.
8. See Comments of American Trucking Association (ATA), LMCC, Motorola, Inc., and TIA. See Comments of the Association of American Railroads (AAR) for an opposing view.
9. See Comments of AT&T.
10. See, for example, Comments of LMCC, 13-14.
11. See 47 C.F.R. § 90.173(a).
12. Inquiry, paragraphs 51-64.
13. The Joint Commenters are Special Industrial Radio Service Association, Inc. (SIRSA), National Association of Business and Educational Radio, Inc. (NABER), American Petroleum Institute (API), American Mobile Telecommunications Association, Inc. (AMTA), Telephone Maintenance Frequency Advisory Committee (TELFAC), and Council of Independent Communication Suppliers (CISS). Joint Comments at 10.

14. Id., paragraphs 52-64.
15. See, for example, Comments of LMCC, and National Telecommunications and Information Administration (NTIA). Advanced Mobilecomm, Inc. (AMI) also proposed a plan similar to this one, although they did not specifically comment on exclusive use overlay. See Comments of AMI.
16. See Inquiry at paras. 65-69.
17. Existing users would, however, be allowed to remain on the channel on a co-primary basis and will be allowed to add new mobiles.
18. See, for example, Comments of California Public-Safety Radio Association.
19. We also propose that until February 1, 1996, EUO applications would only be accepted from existing licensees.
20. See Comments of ATA.
21. For example, we propose protecting systems for which failure of their PLMR system would create an imminent danger to the public safety. This would provide automated railroad systems protection that we believe to be necessary.
22. Inquiry, paragraphs 78-88.
23. Id., paragraph 85.
24. Id. paragraph 91.
25. Id. paragraph 92.
26. LMCC states that this subject "has been the subject of lively debate within the LMCC." Comments of LMCC at p. 23.
27. See, for example, Comments of Forest Industry Telecommunications (FIT).
28. 47 C.F.R. § 90.176.
29. See Joint Comments, Comments of APCO and UTC. APCO is less firm on this issue, generally recognizing that it is a reasonable step, but noting problems such as users having confidence in the coordination system. UTC favors consolidation, but recommends different services from those that we are proposing.
30. Joint Comments at 16.
31. Joint Comments, n. 23.
32. Comments of State of California, 9.
33. This would prevent applicants from being forced to go to non-representative entities for frequency assignment recommendations, as opposed in the numerous reply comments by state highway departments. See, for example, Reply Comments of the New York State Department of Transportation.
34. Inquiry, paragraphs 96-100.
35. Comments of State of California, 6.
36. See, for example Comments of the State of Washington, Washington State Patrol.
37. See for example Comments of AAR.
38. Power levels on many channels would not be substantially reduced. For example, there are many channels available to Business Radio Service licensees in the 460-470 MHz band with a 110 Watt power restriction. See 47 C.F.R. § 90.75(b) and (c).

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39. Systems requiring greater geographic coverage could build additional sites.
40. ATA indicates reassignment of a channel after 50 miles was a reasonable goal. Comments of ATA, 10.
41. APCO-25 is a committee of representatives of federal, state and local public safety agencies which, together with manufacturers, is developing digital standards for use in public safety mobile radio systems. See, for example, Comments of County of Orange, California, and Motorola Inc.
42. This type of operation was suggested by Fred W. Daniel. Comments of Fred W. Daniel.
43. See Future Private Land Mobile Telecommunications Requirements: Final Report, Planning Staff, Private Radio Bureau, FCC, Washington, D.C., August 1983.
44. Decentralized trunking is, and would continue to be permitted. See Inquiry at para. 27.
45. See, for example, Comments of Forestry Conservation Communications Association (FCCA), 8.
46. Joint Comments at n. 16.
47. See 47 C.F.R. § 90.267.
48. See, for example, Comments of Hewlett-Packard Company Products Group (HP).
49. Thus, these would become 6.25 kHz wide channels offset 3.125 kHz from the full power channels.
50. See Comments of HP and Spacelabs.
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APPENDIX A

PROPOSED RULES DISCUSSION

This Appendix discusses the major proposed rule amendments that we propose to adopt to improve spectrum efficiency in the PLMR bands below 512 MHz.¹

Appendix D sets forth the proposed Part 88 in its entirety, along with editorial changes to subpart F of Part 1. A table cross-referencing the current rules and the proposed rules appears in Appendix E. Because this proceeding replaces Part 90 in its entirety, the table will facilitate analysis by the public commenting on the proposed rules.

MAJOR PROPOSALS

Channel Spacing.

Our primary proposal is to reduce channel spacing in the spectrum between 72 and 512 MHz. We propose to reduce channel spacing to 5 kHz for low power mobile frequencies in the 72-76 MHz and for all frequencies in the 150-174 MHz bands. We also propose to reduce channel spacing in the 421-430 MHz, 450-470 MHz and 470-512 MHz bands to 6.25 kHz.² All new assignments would be required to use this narrowband technology. See Appendix D, § 88.413(b)(6).

Transition Period.

At 421-512 MHz, we propose to require existing users to reduce transmitter frequency deviation to reduce occupied bandwidth to 10 kHz by January 1, 1996.³ Thus, three channels would be created from every existing channel. A 12.5 kHz channel would be centered on the original channel's center frequency and be licensed to all existing users. The other two channels would be 6.25 kHz wide, spaced just above and below the 12.5 kHz channel, and would be available for new users. We also propose requiring all users in the 421-512 MHz band to employ 6.25 kHz equipment by the dates set in the proposed § 88.433. Thus, existing users would be required to temporarily adopt pseudo-12.5 kHz equipment.⁴ They would then gradually replace their equipment with true 12.5 kHz equipment that could later be modified to further reduce occupied bandwidth. Finally, existing users would move their carrier frequency either up or down 3.125 kHz and continue operation on either or both of the new 6.25 kHz channels.⁵ See Appendix D, § 88.413(b)(6).

At 150-174 MHz, we propose to require existing users to reduce transmitter frequency deviation to reduce occupied bandwidth to 12 kHz by January 1, 1996. This would reduce adjacent channel noise and permit us to eliminate adjacent channel mileage separations (thus, increasing assignable channels by approximately 20% in most urban markets). We also propose requiring all licensees in the 150-174 MHz band to employ 5 kHz equipment by the dates shown at § 88.433. The new 5 kHz channels would be centered at the existing channels, plus 5 kHz above and below the current channel centers. Existing licensees could remain on one or two of the three channels created from the channel for which they were originally licensed.⁶ The other channel would be designated for innovative shared use operations. See Appendix D, § 88.413(b)(6).

Finally, we propose to require existing users in the 72-76 MHz band to reduce transmitter frequency deviation to reduce occupied bandwidth to 10 kHz by January 1, 1996. Thus, three channels would be created from every existing channel. A 10 kHz channel would be centered on the original channel's center frequency and be licensed to all existing users. The other two channels would be 5 kHz wide, spaced just above and below the 10 kHz channel, and would be available for new users. We also propose requiring all users in the 72-76 MHz band to employ 5 kHz channels by the dates set in proposed § 88.433. See Appendix D, § 88.413(b)(6).

The channel split proposal is a critical element of this Notice. We request comment on each aspect, including the ultimate channel size in each band (5 kHz and 6.25 kHz), whether the channel split should be done in two steps as proposed or one step, the dates of the proposed steps, the specific allotments, and the distribution among new and existing users. In particular, should we adopt a two phase plan leading to 5 kHz channelization between 421 and 512 MHz, where the first phase splits the current channels into a 15 kHz channel, with two 5 kHz channels, spaced just above and below the 15 kHz channel?

Technical Standards.

The proposed channel splitting in the frequency bands below 800 MHz will result in narrower channel spacings that require new technical standards. These proposed standards are simpler and more flexible than those they replace.

Channel Bandwidth.

We propose occupied bandwidths of 4 kHz and 5 kHz for frequency bands with channel spacing of 5 kHz and 6.25 kHz, respectively. We also propose appropriate channel bandwidths for the transitional stage. Because modulations other than frequency modulation may be utilized, frequency deviation limits are no longer specified. Following industry standards, transmitter frequency stability is now specified in parts per million (ppm) rather than in percent of the carrier frequency. See Appendix D, §§ 88.413(b)(6) and 88.425.

Spectrum Efficiency Standards.

We propose new spectrum efficiency standards that would permit use of non-standard bandwidths provided that such use is at least as efficient as narrowband technology. These proposed spectrum efficiency standards are intended to increase technical flexibility. An important aspect of these rules is that the proposed § 88.433(d) contains the deadlines for existing systems to completely convert to narrowband equipment. See Appendix D, § 88.433.

Emission Masks.

We propose two new emission masks. The first is for transmitters operating on frequencies with 5 kHz spacing in the 72-76 MHz band designated solely for low-power mobile use, and also for transmitters operating on frequencies in the 150-174 MHz or 216-222 MHz bands. The second mask is for transmitters operating on frequencies with 6.25 kHz spacing in the 421-512 MHz band. Both of the proposed masks are based on the mask developed for the 5 kHz channels in the 220-222 MHz band. The masks are designed to provide 40 dB of attenuation at the edge of the

authorized channel, 50 dB attenuation at the edge of the authorized bandwidth of the adjacent channel, and 65 dB of attenuation thereafter. Because the technical flexibility afforded licensees could result in the use of non-standard wide-band channels, mask attenuations are specified from the edge rather than from the center of the authorized bandwidth. See Appendix D, § 88.421.

Licensing of Channels.

Spectrum below 470 MHz is currently licensed on a shared basis. We propose to continue to license some channels on a shared basis only and to make other channels available for exclusive licensing under specified circumstances. We also propose to set aside a number of channels for innovative shared use among a limited number of licensees. Each of these proposals are forth in specific headings below.

Shared Use Channels.

We propose to set aside 90 base station channels in 150-174 MHz and 450-470 MHz for shared use under our current assignment policies.⁷ Specifically, we propose to set aside a number of frequencies in the General Category Pool. In the 450-470 MHz band 45 narrowband channel pairs created from the first step of the channel split would be set aside. In the 150-174 MHz band, 45 shared use frequencies would be derived from Business Radio Service frequencies spaced every 30 kHz (rather than the current standard 15 kHz).⁸ See Appendix D, § 88.667.

Innovative Shared Use Radio Operations.

We propose granting five licenses in each of 7 regional markets⁹ for a new type of shared use radio operations. See Appendix D, §§ 88.997-88.1009. Each of these licensees would be assigned two channel pairs for system control purposes on an exclusive basis. See Appendix D, § 88.1001. Approximately 250 channel pairs in the 150-162 MHz band would be shared for voice/data communications. See Appendix D, § 88.999. By monitoring the limited number of control channels, each licensee could easily identify which voice/data channels are currently in use and which are available for its use.. See Appendix D, § 88.1009. We propose a large service area to provide maximum operational flexibility.

We propose no co-channel separation requirements, and instead will rely on the shared nature of the service to minimize interference and, in cases where problems do arise, recommend licensees to use alternative dispute resolution methods. If the alternative dispute resolutions fail or one or both parties to the interference complaint choose not to use such methods, the licensees may file a complaint with the Commission. We would use two guiding principles in resolving such cases: 1) all innovative shared use licensees must cooperate with each other; and 2) the last licensee to construct will be responsible to correct the problem. If appropriate, we would set up a formal hearing and charge appropriate fees. We may also require an intermediate resolution, including that both licensees cease operations until the complaint is resolved. See Appendix D, § 88.1009.

We propose that sharing for this type of operation generally be limited to five licensees per market. It may be difficult to efficiently monitor more control channels. We do, however, propose that additional grants could be made if enough existing

licensees provide concurrence. See Appendix D, § 88.1007. The preferable alternative would be competitive bidding, but we lack legislative authority. Thus, we propose that the five licenses per market be lotteried. To limit speculative behavior, we propose limiting eligibility to existing licensees (10 base stations in any radio service in the region applied for) of reasonable size (\$1,000,000 in sales or expenditures per year). We seek comment on specific measures of experience and on the proposed minimum size requirements. We leave the issue of whether wireline telephone common carriers should be eligible for innovative shared use licenses to a future proceeding covering wireline eligibility in all bands, including the 220-222 MHz, 851-866 MHz and 935-940 MHz bands. We seek comment on more flexible eligibility requirements that would open access to any bona fide applicant who can demonstrate financial qualifications and the ability to operate the system. See Appendix D, § 88.1005. The license term would be ten years. See Appendix D, § 88.119(d). The application fee would be based on the number of channels and the minimum number of base stations.

We propose construction of a specific number of channels at the end of the first and second 10 year license terms. The number of required channels at the end of the first term is not the full set of channels because the full set of channels will not become available until 2004-2012 depending on the market. Licensees have at least two solutions to the problem of channel availability. First, innovative shared use radio operations eligibles could free their assigned channels by financing other licensees in the 150-174 MHz band to convert to narrowband equipment sooner than the deadlines specified at § 88.433. Second, innovative shared use radio operations licensees could purchase channels from other licensees. See Appendix D, §§ 88.1003 and 88.1013.

We propose that starting with the second license term, innovative shared operation licensees be required to improve spectrum efficiency by the end of each license term. We believe that many alternatives will exist to generate these improvements. For example, phased array antenna systems should be available on a commercial basis even before we could begin licensing this new type of operation. See Appendix D, § 88.1015.

We also seek comments on an alternative proposal to divide the same channels into five blocks of approximately 50 channels for exclusive assignment to five licensees in each region. Although each licensee would have access to fewer channels with this approach, each licensee would have more flexibility and a greater incentive to use their spectrum efficiently.¹⁰ For example, licensees could implement advanced technologies or provide different grades of service, e.g., blocking, without having to coordinate with each other.¹¹

Finally, we would not accept applications for this type of operation until at least January 1, 1996. When we are ready to accept such applications, we will issue a Public Notice providing at least 30 days notice for a one day filing window.

Exclusive Channels.

We propose to allow applicants and licensees to convert currently shared use channels and new channels (except those continuing to be used on a shared basis only) to exclusive use channels if loading justifies such conversion. To convert currently shared use channels to exclusive use, we propose a marketplace

mechanism, called exclusive use overlay (EUO), that will provide applicants/licensees the opportunity to obtain exclusive use of channels below 470 MHz.¹²

Exclusive Use Overlay (EUO).

Exclusive Use Overlay (EUO) is a marketplace mechanism that gives licensees with sufficient loading the opportunity to protect their radio environment by converting currently shared use channels to exclusive use channels. See Appendix D, § 88.179. The licensee would be required to file an EUO request with a frequency coordinator. The EUO request may take one of two forms. First, if the licensee has the concurrence of all large co-channel licensees (as defined by loading)¹³ within 80 km (50 mi), the licensee would be given an EUO license and no new licensees would be added to the channel.^{14 15} See Appendix D, § 88.203. Second, if the licensee does not have concurrence from all the co-channel licensees needed, but has at least one-half of the necessary concurrences, we will freeze new licensing on the channel in the particular geographic area for 120 days to give the applicant the opportunity to continue its efforts to convert the channel to exclusive use. See Appendix D, § 88.195.

EUO Eligibility.

We propose that an applicant for a channel without current licensees must meet the loading requirement within 8 months of its authorization. This proposal is consistent with our current rules and would reduce opportunities for speculation. A licensee with less than the loading limit would not have its authorization cancelled, but rather would be subject to additional loading on the channel. Frequency coordinators would be instructed to recommend lightly loaded channels, reserving unused channels for those later applicants that may be able to justify exclusivity. In particular, we seek comment on what rule changes, if any, should be made to deter channel speculation by SMRs in the 460-470 MHz band once empty narrowband channels become available on January 1, 1996.

We do not propose specific loading levels if the EUO applicant receives concurrence from some licensee with an EUO preference. This is because the concurrence requirement should be sufficient to insure that the EUO licensee will make use of the spectrum.

If there is no existing licensee on that channel in the appropriate geographic area large enough to qualify for an EUO preference, then in addition to loading, we would require that the EUO licensee's system be narrowband (or just as spectrum efficient). Thus, if a current channel in the 150-174 MHz in Chicago area has many users, but none with 50 or more mobiles, then an applicant for EUO license would have to have at least 50 mobiles per channel, plus use narrowband (5 kHz) equipment. In the case of an existing licensee this would require increasing the number of mobiles and converting the existing system to narrowband equipment within 6 months of the grant of the EUO license. See Appendix D, § 88.79.

Additional Channels, Spectrum Efficiency Standards and EUO.

The proposed rules include provisions to inhibit speculative licensing (see Appendix D, § 88.187(b) and (c).). An existing system

receiving EUO rights would not have to implement spectrum efficient technology in advance of general deadlines unless the licensee were to obtain additional channels. The proposed rules specifically prevent various techniques, including use of management contracts, from circumventing this spectrum efficiency requirement. See Appendix D, § 88.207.

Loading Criteria in the 150-174 MHz and 450-470 MHz bands.

We propose loading criteria for the bands below 470 MHz that are different from those above 800 MHz. Specifically, we propose three categories. The first category (70 mobiles per channel) would include only New York and Los Angeles. The second (50 mobiles per channel) would cover 73 geographically broad markets. This second category would probably include the majority of all applications. The third (20 mobiles per channel) would cover the rest of the country. The proposed criteria are generally lower than those above 800 MHz primarily because these loading criteria would be established for different purposes than the loading criteria for systems above 800 MHz. For example, these loading criteria do not guarantee exclusivity. Loading would be used for two purposes under the EUO proposal. First, loading would be a measure of whether a licensee is large enough to qualify for an EUO preference. Second, loading would be used as justification for keeping more than one of the channels created by replacing their existing channel with narrowband assignments.¹⁶ See Appendix D, § 88.273.

EUO Wide-Area Systems.

The loading criteria discussed in the previous paragraph only directly cover single-site systems, but many PLMR users require multiple sites. Thus, we propose two wide-area system options. The first is identical to the current option for the bands above 800 MHz. Under that option, for a licensee meeting certain eligibility criteria, each mobile would be counted at every site. Under the second option, which would be available to all licensees, loading criteria would be essentially proportional to the total geographic area protected from further licensing when each site is provided the standard 80 kilometer protection.¹⁷ See Appendix D, § 88.277.

Loading Criteria in the 470-512 MHz Band.

We propose simplifying loading in the 470-512 MHz band in two respects. First, loading now varies according to radio service. We propose fewer categories. Second, loading is now used to cap channel usage in a 20 or 40 mile radius, depending on the urban market and frequency.¹⁸ We propose that loading be used to cap licensing in the entire urban market. See Appendix D, § 88.293.

Private Land Mobile Radio Services.

Currently there are 21 PLMR services, 19 of which are the focus of this Notice. These services are five current plus one proposed Public Safety Radio Services (Local Government Radio Service, Police Radio Service, Fire Radio Service, Highway Maintenance Radio Service, Forestry-Conservation Radio Service, plus the Emergency Medical Radio Service proposed in PR Docket No. 91-72), the Special Emergency Radio Service,¹⁹ nine Industrial Radio Services (Power Radio Service, Petroleum Radio Service, Forest Products Radio Service, Video Production Radio Service, Relay Press Radio Service, Special Industrial Radio Service,

Business Radio Service, Manufacturers Radio Service, Telephone Maintenance Radio Service), and four Land Transportation Radio Services (Motor Carrier Radio Service,²⁰ Railroad Radio Service, Taxicab Radio Service, Automobile Emergency Radio Service), in addition to the Radiolocation Radio Service and the Specialized Mobile Radio Service.

As indicated in the text of this Notice of Proposed Rule Making, we propose to either consolidate these radio services into three broad categories (Public Safety, Non-Commercial, and Specialized Mobile Radio Service) plus a General Category Pool encompassing all three broad categories, or retain the current radio service categories and assign to those services their existing frequency assignments but assign all new channels to the proposed three broad categories and the General Category Pool. We do not favor either of these alternatives. We believe, however, that some consolidation is necessary to achieve the maximum benefits from the PLMR spectrum and from the other changes proposed in this Notice of Proposed Rule Making. While the proposed Part 88 and the underlying basis for the broad range of proposals contained herein is predicated on one set of assumptions keyed to consolidating the services into three categories and a general frequency pool, we invite comment on all alternatives that will assist us in writing regulations that maximize the benefits of the PLMR spectrum below 512 MHz.

Public Safety Radio Service.

We propose to create the Public Safety Radio Service, which would merge six current and proposed PLMR services. This would be the only service with significant eligibility requirements. Frequencies below 470 MHz designated for this service may be coordinated only by the current certified public safety coordinators. Public safety eligibles would also be eligible in the other proposed services. See Appendix D, §§ 88.13 and 88.613.

Non-Commercial Radio Service.

We propose to merge the services in subparts C, D and E of Part 90 (generally covering Industrial/Land Transportation) into the Non-Commercial Radio Service. Eligibility in the Non-Commercial Radio Service would be for entities seeking to operate a system for the licensee's internal use. There would be no multiple licensing option for this radio service,²¹ although limited selling of excess capacity would be permitted. The proposed rules on management contracts and excess capacity are intended to prevent systems being used to circumvent limits on SMRs use of Non-Commercial Radio Service frequencies. Channels for this radio service would include most of those in subparts C, D and E.²² Frequencies below 470 MHz designated for this service may be coordinated by any certified coordinator. Above 800 MHz, this service would replace the Industrial/Land Transportation Pool. We expect that such a change would be non-substantive. See Appendix D, §§ 88.15 and 88.617.

Specialized Mobile Radio (SMR) Service.

We propose that all private carriers be called SMRs. The only channels specifically designated for SMRs would be those currently designated for their use above 800 MHz (and in the 220-222 MHz band for nationwide licenses). See Appendix D, §§ 88.17 and 88.621.

General Category Pool.

We propose to create the General Category Pool. This pool would be available both to licensees operating their own radio systems and to private carriers. The channels for this pool would come from the Business Radio Service, except those designated only for airport or central alarm station use. All currently certified frequency coordinators would be able to provide coordination services for the new General Category Pool (for frequencies below 470 MHz). The main changes above 800 MHz would be to eliminate additional quasi-commercial operations such as community repeaters, instead requiring such systems to be licensed as SMRs. Existing community repeaters could continue operation and add additional users (unless in conflict with an EUO license). See Appendix D, §§ 88.21 and 88.625.

Interservice Sharing of Frequencies in the 150-174, 421-430 and 450-470 MHz Bands.

We propose that SMRs be given limited entry into Non-Commercial Radio Service channels. Significantly, we would limit SMRs to reassignments of channels licensed and operated by long standing bona fide Non-Commercial or Public Safety licensees. Thus, these provisions would permit some expansion by SMRs where General Category frequencies are exhausted, yet preserve the option for individual users to own and operate a system for internal communications requirements. See Appendix D, § 88.309.

Transmitter Power/Antenna Height.

In the 150-174 MHz and 450-470 MHz bands, we are proposing a maximum authorized transmitting effective radiated power (ERP) of 300 watts for stations with an antenna height above average terrain of up to 60 meters (197 ft), with power reductions for increasing antenna heights. We have assumed desired/undesired signal strengths of 37/27 dBu, and the power/height limitations should enable frequency reuse at approximately 80 km (50 mi). The power limitations at high elevation antenna sites will also decrease the potential for co-channel interference at extended distances. See Appendix D, § 88.429(d).

Grandfathered Maximum Power/Antenna Heights and Bandwidths.

We propose that all systems in the 150-174 and 450-470 MHz band meet the more stringent power/antenna height and bandwidth limitations by January 1, 1996. In addition, prior to that date, any trunked channel, new channel or new site, plus any system with an EUO license more than six months old, must meet the new standards. See Appendix D, § 88.1563.

MISCELLANEOUS PROPOSALS

The following sections include a wide variety of miscellaneous proposals in addition to the major topics discussed above.

Co-Primary 450 MHz Offset Channels.

We propose that the ten 450-470 MHz offset channel pairs currently available only in the Special Industrial Radio Service remain available on a primary basis.²³ To minimize interference, however, we would require that base stations on these channels be

removed at least 15 km. (9 miles) from base stations on adjacent channels. See Appendix D, § 88.679.

Emergency Medical Channels.

We propose that the five channel pairs in the 220-222 MHz that PR Docket No. 91-72 proposes to designate for a proposed Emergency Medical Radio Service be restricted to eligibles for that proposed service. This would provide some quick relief to the problems identified in that Docket. See Appendix D, § 88.673.

Extended Implementation.

We propose the extended implementation option for primarily public safety systems above 800 MHz be available in all bands and to any type of licensee provided they can show cause. See Appendix D, § 88.135.

Finder's Preference.

We propose extending the finder's preference provisions to include any exclusive channel assignment. See Appendix D, § 88.229.

Fixed Operations in the 72-76 MHz Band.

We propose replacing our current rules for fixed use of the 72-76 MHz band (§ 90.257(a)) with the rules at § 22.599 for similar operations by common carriers. Those rules are simpler, less burdensome, more flexible, and work for stations operating at higher power levels than permitted PLMR users for the same channels. See Appendix D, § 88.1189.

Fixed Operations in the 150-174 and 450-470 MHz Bands.

We propose that existing fixed use operations be permitted to continue on a secondary basis. We also propose, however, to limit new secondary fixed assignments and significant modifications of existing fixed use systems (other than signaling, ancillary data and alarm operations), to channels with exclusive licensees, and require any applicant for fixed use to receive concurrence from all relevant exclusive licensees. These restrictions are also sufficient for us to propose extending this option to the 150-174 MHz band. Fixed operations would have to conform with the new technical standards at the required dates. See Appendix D, §§ 88.1179 and 88.1203.

Itinerant and Temporary Operations.

We propose to increase the number of itinerant frequencies beyond those created by a proportional increase from the channel split. See Appendix D, § 88.953. We seek comment on the appropriate number of itinerant frequencies. In addition because applications for operations at temporary locations cannot be granted in areas where a licensee has an exclusive assignment and the existence of temporary assignments at unspecified locations makes it difficult to coordinate new exclusive assignments, we seek comment on whether provisions for operation at temporary locations should be eliminated. See Appendix D, § 88.147.

Limits on Shared Channels in the 25-50 MHz, 150-174 MHz and 450-470 MHz Bands.

We proposed no substantive changes in the number of shared channels an individual licensee may hold. See Appendix D, § 88.243. We seek comment, however, on whether this limit (two channels from the proposed Subpart D for public safety systems and one channel for non-public safety systems) should be relaxed. In particular, should this limit be relaxed when a licensee converts to narrowband equipment in the 150-174 MHz or 450-470 MHz bands? More generally, is any limit necessary?

Low Power Operations.

We propose designating 96 additional channels in the 460-470 MHz band and 24 channels in the 155-156 MHz band for low power (2 watt) use, in addition to the narrowband channels resulting from splitting the existing low power channels, and low power 450-470 MHz offset channels.

We further propose that the 450-470 MHz offset channels be reduced to 12.5 kHz by January 1, 1996, and to 6.25 kHz by the dates specified at § 88.433. The proposed 464/469 MHz low power channels are 6.25 kHz channels that would result from the first step of the channel split of the channels between 464.300 and 464.975 MHz.²⁴ Twelve of those 25 kHz channels are currently used for local control use only.²⁵ These channels could meet the need for additional low power channels as discussed by several commenters.

The channels in the 155 MHz range would serve as a guard band between the transmit and receive frequencies for innovative shared use operations, in addition to meeting the spectrum needs of low power users. See Appendix D, §§ 88.905-88.911.

Low Power Telemetry Operations.

We propose permitting very low power (20 mW or less) telemetry operations on any channel offset by 3.125 kHz from a channel in the 450-470 MHz band listed in subpart D. This would create over 1700 new channels available on a secondary basis. Thus, we propose broad eligibility requirements. In addition, the very low power of such operations eliminates any need for specific licensing information. Thus, such operations would not require a separate authorization. See Appendix D, § 88.1299(b).

Old Subpart O - Transmitter Control.

We propose deleting almost all our rules on transmitter control. These rules are generally outdated and overly regulatory. It is superfluous to state "radio transmitters at remote locations may be operated and controlled through use of wire line or radio links; or through dial-up circuits, ... Such control links or circuits may be either those of the licensee or they may be provided by common carriers...."²⁶ The most important section of Subpart O concerns interconnection. We do propose eliminating the restriction on geographic areas where interconnect may occur.²⁷ The prime justification for the existing rule is that it reduces use of shared channels in areas likely to suffer from spectrum congestion. Given our exclusive use overlay proposal and channel split proposals, we believe such restrictions would become unnecessary, because of the reduced number of shared channels and the vastly increased amount of capacity that would be available. On the other hand, we

would still require PLMR licensees to comply with restrictions on interconnection contained in Section 332 of the Communications Act of 1934, as amended. See Appendix D, § 88.321(c).

Operations at 2000-3000 and 5167.5 kHz.

We propose no rules corresponding to Sections 90.47, 90.53(b)(1) and 90.253 concerning operations at 2000-3000 kHz and 5167.5 kHz. A review of our licensing records indicated no applications under these rule sections. The rare applicant for these frequencies could file for a rule waiver.

Out-of-band Chirp Limitations.

We propose to add to our frequency stability limitations the requirement that all transmitters type accepted under Part 88 limit "chirps", e.g. transient transmissions at a rapidly changing frequency that may extend a few megahertz from the carrier frequency, to less than 20 milliseconds duration. In the past decade, synthesized transmitters have become common. This type of transmitter, if not properly designed, can cause brief chirps that could cause interference to other users, particularly to television receivers operating in adjacent bands and to other licensees operating digital systems. See § 88.425(c).

Partial Assignments.

We propose expanding the explicit option to make partial assignments to most frequencies under this part. In addition, the definition of partial assignment would allow a licensee to employ narrowband equipment and assign the rest of the original channel-width to another applicant. See Appendix D, § 88.127.

Power Limitations For Paging Operations.

We propose no changes to the power limitations for paging operations. We seek comment, however, on whether to raise permissible power levels on some paging frequency(s), and, if so, to what power and when? See Appendix D, § 88.1067.

Reduced Paperwork Requirements.

We propose to eliminate several rules that impose unnecessary regulatory burdens. For example, licensees are currently required to furnish us with detailed technical information describing the radio system so that we can process license applications or review compliance with our operational rules.²⁸ The information from these reporting requirements is not, in fact, used by our staff.

Shared Use of Radio Stations and Multiple Licensing.

We propose reducing the options for shared use to private carriers (SMRs) only. We also propose eliminating all forms of multiple licensing.²⁹ In the past, shared use was needed by industry because certain radio facilities became too expensive for a single small licensee. This need was significantly reduced by the rise of SMRs and other private carriers. Shared facilities and multiple licensed systems (such as community repeaters) are, from the point of view of most actual users, indistinguishable from private carriers. On the other hand, shared use and multiple licensing increase paperwork and cause the licensing database to

contain unnecessary and often misleading information. See Appendix D, § 88.321.

Spread Spectrum Operations

We propose to include direct sequence spread spectrum systems for use in public safety covert operations. Because of the availability of direct sequence spread spectrum equipment, we believe that it would be in the public interest to not limit the use of spread spectrum systems by public safety eligibles solely to frequency hopping equipment. We seek comment on this proposal with respect to potential interference to normal operations by direct sequence spread spectrum systems. See § 88.491.

Trunked Operations.

We propose permitting centralized trunking below 800 MHz. Our proposed rules require either exclusivity or written concurrence. One particular difficulty in defining sufficient exclusivity concerns the proposed reduction of power. Thus, the proposed § 88.445(b) contains provisions about the area of exclusivity required to trunk given both current and proposed power limitations. We also propose that trunked operations be designated by a station class ending with a Y. Licensees seeking to trunk several channels they are currently licensed for would be required to modify their station class, and thus undergo frequency coordination. Frequency coordination is important in these cases because the applicant desiring to trunk several channels must identify co-channel licensees and, in certain cases, note their ERP and antenna height. All proposed trunked operations would be required to meet the power requirements set in proposed § 88.429. See Appendix D, §§ 88.445 and 88.1563.

Wideband Paging.

We propose permitting paging systems to continue operating on wideband (25 kHz) channels. Our proposed channelization scheme has been designed to properly separate two-way mobile operations and paging operations. For example, only two narrowband (5 kHz) channels, 158.440 and 158.445 MHz, would be created from the channel currently centered at 158.445 MHz. Those new narrowband channels are sufficiently removed from the paging channel centered at 158.460 MHz, so that wideband paging operations should not interfere with adjacent 5 kHz two-way narrowband mobile operations. New paging systems would be required to meet the out-of-band emissions requirements for narrowband two-way land mobile equipment. We also propose eliminating secondary two-way mobile use of paging frequencies. We do that to limit potential interference. Finally we seek comment on whether to designate specific narrowband paging channels. See Appendix D, § 88.1061.

FOOTNOTES TO APPENDIX A

1. Minor rule changes (rules that we propose to delete because they are redundant or unnecessary, or that are changed in format or style, reworded or renamed, or only reflect non-substantive changes) are not discussed in this Appendix. The reader should closely examine Appendix D and Appendix E to ascertain these minor changes.

2. We propose different channel spacing in different bands to minimize transition costs to existing users. The 6.25 kHz channelization is as or more efficient than the 5 kHz because the 6.25 kHz channelization permits the creation of over 1700 additional offset channels for low power use in the 450-470 MHz band.

3. Adjacent channel interference protection would not be provided. To avoid such problems, licensees should reduce the bandwidth of their receivers.

4. For the purpose of this proceeding, we will consider minor changes made to a transmitter's modulation stage to achieve reduced bandwidth as a Class I permissive change under the provisions of § 2.1001(b)(1).

5. A licensee can only keep the lower 6.25 kHz channel pair if they convert to narrowband technology at least two years before the deadline specified in the proposed § 88.433. See Appendix D, § 88.281.

6. A licensee can only keep the upper 5 kHz channel if they convert to narrowband technology at least two years before the deadline set in proposed § 88.433. See Appendix D, § 88.281.

7. In addition, the entire 25-50 MHz band, and an increased number of low power channels will also be assigned on the current shared basis. Finally, we are also increasing the number of itinerant frequencies, which are also available for shared use.

8. On January 1, 1996, existing 150-174 MHz Business Radio Service licensees operating on 30 kHz channels must reduce occupied bandwidth to 12 kHz (i.e., to a 15 kHz channel), thus creating three new narrowband channels in addition to the 15 kHz channel for existing users. Eventually the remaining 15 kHz channel would be converted to three 5 kHz channels.

9. The markets would be those used for the Regional Bell operating companies.

10. See Notice, paras. 52-53.

11. Mandatory technology upgrades might not be required under this approach.

12. There is already a mechanism (loading limits) for exclusive channel assignments in the 470-512 MHz band. See 47 C.F.R. § 90.313.

13. We also propose that as an alternative to being large, a licensee may make a showing that failure of the licensed system would create an imminent danger to the public safety. For example, failure of certain railroad radio systems could directly lead to accidents.

14. Existing licensees could continue adding mobile units.

15. We propose that exclusivity over a channel mean the entire assignment. Thus, until January 1, 1996, the day bandwidth by existing users must be reduced, an EUO licensee authorized for a channel in the 450-470 MHz band using the current bandwidth would be protected from new 6.25 kHz narrowband assignments on channels listed in Subpart D removed from the current center frequency by 3.125 or 9.375 kHz. After January 1, 1996, the EUO licensee would be protected from new assignments only on frequencies removed from the center frequency by 3.125 kHz.

16. Keeping more than one channel under these proposals should not be equated with "having" those channels, as this concept would apply for trunked systems above 800 MHz, because exclusivity is a separate issue.

17. For example, we propose providing a single site system with an EUO license protection from additional licensing within an 80 kilometer radius, thus providing protection in an approximately 20,000 square kilometer area. Consider a ten-site wide-area system, with each site receiving 80 kilometer protection, with sufficient overlap in the protection areas of the individual sites so that the total area protected is 100,000 square kilometers. The loading criteria for that ten-site wide-area system would be five times that of a single site system.

18. See 47 C.F.R. § 90.313(c).

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19. The Special Emergency Radio Service has ten diverse eligibility categories: Medical, Rescue organizations, Physically handicapped, Veterinarians, Disaster relief organizations, School buses, Beach Patrols, Establishment in isolated areas, Communications standby facilities, Emergency repair of public communications facilities.
 20. The Motor Carrier Radio Service also breaks down into Interurban Passenger, Interurban Property, Urban Passenger and Urban Property.
 21. Existing community repeaters could operate indefinitely, including adding additional users.
 22. Certain channels currently allocated to the Business Radio Service would be allocated to the General Category Pool. All entities eligible for the Business Radio Service would be eligible for the Non-Commercial Radio Service.
 23. Most of the 450-470 MHz offset channels currently listed in § 90.267(b) are low power and available only on a secondary basis.
 24. We also propose creating 4 additional low power itinerant channel pairs from that same frequency range.
 25. See 47 C.F.R. § 90.75(c)(29).
 26. 47 C.F.R. § 90.461(b).
 27. See 47 C.F.R. § 90.477(d)(3). The restriction only covers certain non-public safety radio services.
 28. See, for example, 47 C.F.R. § 90.129(c), (d) and (f).
 29. Existing shared and multiple licensed systems could continue operation indefinitely, including adding users to community repeaters.
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